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FOOD DIGEST

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NATIONAL INFORMATION CENTRE FOR FOOD SCIENCE & TECHNOLOGY
AT
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* RAW MATERIALS *
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305 Technique for annual mango crop

The Central Mango Research Station in Lucknow has developed a technique which will enable mango growers to reap a crop every year instead of an alternate years. Experiments carried out at the station have shown that spraying of a solution of ethephon, a chemical, with urea will induce flowering in mango trees during the lean years. The solution should be sprayed five times from the middle of September to get the desired results. Biennial bearing (flowering of trees in alternate years) is a cause of heavy loss to mango growers, particularly in the northern parts of the country, where most of the commercial varieties such as dashehri, langra and chausa are prone to biennial bearing. (Data India. 31; 1978; 483)

306 8-point plan to raise gram yield

The Centre has drawn up an eight-point plan to step up gram production in the coming rabi season. A national campaign is to be launched in this connection. Gram-producing States have been asked to coordinate the activities of the concerned departments. The plan underlines the need to ensure availability of adequate quantities of phosphatic fertilizers. An average dose of 30 kg of phosphorus pentoxide per hectare has been suggested and the States are to work out the total needs. Arrangements are also to be made for pesticides and plant protection equipment. Gram is an important pulse crop in Punjab, Haryana, Uttar Pradesh, Madhya Pradesh, Rajasthan, Bihar and Maharashtra. Since the gram yield increase with the use of seed treated with rhizobium cultures, State governments have been told to place their indents with the microbiological laboratories well in advance of the sowing. (Data India. 36; 1978; 563-4)

307 3-fold increase in grape cultivation proposed

The Horticulture Department of Karnataka proposes to extend the area under grapes from 5,000 hectares at present to 15,000 hectares. The present area accounts for 50% of the total area under grapes in the country. Over 100,000 tonnes of grapes worth Rs.25-million are produced annually in the State - 80,000 tonnes of Bangalore blue, 20,000 tonnes of Anabshahi and 3,000 tonnes of Thomsons seedless. Efforts are being made to get assistance for grape cultivators from the nationalised banks and to liberalise procedures for lending money to small farmers. The department has increased the loan amount to grape growers from Rs.10,000 to Rs.15,000 per acre. (Data India. 45; 1978; 715)

Macadamia
308 New macadamia variety

The Cardamom Board has introduced a new cash crop called 'Mecadamia', the kernels of which could be served as snacks and used as a substitute for cashew kernels in preparations, among other uses. The seedlings can be grown in climates suitable for coffee and cardamom. (Data India. 33; 1978; 515)

STORAGE

309 Evaluation of storage structures

It is generally observed that the traditional storage structures in rural areas are susceptible to moisture, rodent and insects, which are responsible for most of the losses occurring in quantity and quality of stored grains. Investigations are in progress at the Institute to find out the suitability of conventional and modern storage structures to store paddy. Five different types of paddy storage structures (bamboo bin, mud brick bin, steel bin, plastic bin and ferrocement bin) have been tested in respect to

temperature, moisture content and damaged grain. The minimum paddy damage (6-8%) was observed in plastic and ferrocement bins as compared to conventional storage (gunny bags storage) where loss was 30-33%. The safe level of moisture content for paddy storage was found to be about 12% for long-term storage and 14% for short-term storage. The temperature should be below 25°C. (Rice Research News. 4(2); 1978; 2)

310 Scientific storage saves 243,000 quintals of grains

Scientific storage and rodent control methods initiated under the 'save foodgrains campaign' of the Centre have protected 243,000 quintals of foodgrains valued at Rs.36.5 million during the last five years in Madhya Pradesh. Of the Rs.16.1-million interest-free loans given by the Centre to 19 States for improving storage facilities in rural areas, Madhya Pradesh received Rs.1.2-million. The amount was utilised by the MP Agro-Industries Corporation for fabricating bins at Bhopal, Raipur, Ujjain, Indore and Khurai. Fabrication centres at Gwalior and Jabalpur will be started soon. Till date 7,000 bins have been sold at subsidised prices to farmers. 350 villages in the districts of Bhopal, Raisen, Vidisha, Schore and Hoshangabad have been adopted for intensive work under the medium contact programme of the campaign covering 40 to 55% of houses. 22 villages have been developed as model villages with all the houses covered. Rural women are being trained at Gwalior, Jabalpur and Indore for undertaking domestic-level storage improvement steps. The Centre has also given Rs.1.2-million grant-in-aid to the State for aiding farmers with pesticides and storage improvement. UNICEF has provided Rs.500,000 for grain storage modernization in Barasia block of Bhopal district. (Data India. 45; 1978; 718)

311 Rat poison

BAR BAIT, a new form of rat poison consists of grain coated with tallow, beeswax and confectioners, sugar mixed with Prolin, a powerful and effective rat poison. Because its ingredients are

compressed into a bar, the product does not crumble or blow away and damp or wet conditions do not make it soggy or messy.

The solid form, enables Bar Bait to be placed on rafters, joists, under floors and in other locations normally difficult for the placing of poison. Death usually starts to occur within three days, but the rodents do not become bait shy and continue to eat the cereal bar. It is safe to other animals - should cats or dogs eat it, they will regurgitate before taking a toxic dose. (International Pest Control. 20(3); 1978; 26)

312 Rodent control system

The Sonitron Model-S rodent control system, which includes a control module and four satellite units, has nominal coverage of 10,000 square feet. Each satellite covers 2,500 square feet. The addition of upto a total of eight satellites increases coverage to 20,000 square feet. Each satellite transmits high frequency sound waves inaudible to most humans, yet within the hearing range of most rodents. (Processed Prepared Food. 147(3); 1978; 78)

313 "Dormavac" preserves products for weeks

A new commercial product that can preserve perishables for weeks without freezing, so that they can be shipped fresh without the cost of air freight has been announced by Grumman Corporation.

Called Dormavac, the system creates a cold but above freezing - environment with high relative humidity and very low pressure air that is constantly changed inside an aluminium container that can be transported by truck, rail or ship.

Dormavac creates new worldwide markets for perishables - papayas from Hawaii to New York, mangoes from Mexico to Japan, lamb from the United States to Iran - by stretching the season and extending transportation life. The system is also available in 5,000 or 10,000 cubic foot warehouses. (Food in Canada. 38(5); 1978; 47-8)

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 ** FOOD ADDITIVES **
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314 Corn sweetener replaces sucrose

A 60 percent fructose syrup reportedly is 10 percent sweeter than sucrose-based sweeteners, and can be used to totally replace sucrose products in a variety of food products. The product, Luv-U-Dex 600 brand High Fructose Corn Syrup, is offered by Fleischmann Corn Sweeteners, and like their other corn sweetener products, is ion-exchange refined for best quality.

The syrup is marketed at 77 percent solids, and is easily handled in existing sweetener bulk storage installations. Crystallization does not occur when the product is stored at the recommended temperatures (70-80°F), and color stability is said to be excellent. (Processed Prepared Food. 147(3); 1978; 52)

315 Cocoa extenders

Carob powder can be used as a natural extender for cocoa and chocolate. At one-fifth the cost of cocoa, carob extenders can be substituted upto 30% at a substantial saving without altering the formula or the chocolate flavour of the product. (Processed Prepared Food. 147(7); 1978; 90)

316 Encapsulated acid for sausage products

An encapsulated acid (glucono delta lactone) can replace lactic acid in the formulation of dry, semi-dry and smoked sausage products. The free-flowing crystalline product costs less per pound of meat than lactic acid starters, and eliminates the need for thawing, freezer storage, mixing and incubation time.

Durkote GDL 135-50 is blended with the sausage emulsion before stuffing. At temperatures of 135°F the lactone reacts quickly, forming gluconic acid. The gluconic acid effectively cuts pH levels.

Use of the product enhances color, flavor and texture. Meat emulsions are always uniformly treated throughout the batch, and from batch to batch. (Processed Prepared Food. 147(3); 1978; 54)

317 Two new coconut combination flavors

Two new formulations that offer new taste with great flexibility have been introduced. One of the new items is called Artificial Coconut Cream X460, a combination of artificial coconut with other components producing a smooth tasting delicious end-product.

The second new item is N & A Chocolate-Coconut X461, blending natural and artificial chocolate flavors with the finest coconut. The standard formulation includes caramel color, which can be omitted on request. These two new items can be used advantageously for cream centre candies, icings, fillings, beverage syrups, ice cream mixes, water ices or sherbets. (Food in Canada. 38(4); 1978; 71)

318 Egg flavor

A new egg flavor has been introduced which can be used to enhance taste, aroma and appeal in such "no-egg" foods as scrambled eggs, mayonnaise, French toast, eggnog, pancake batter, batter for deep fat frying and salad dressing. (Processed Prepared Food. 147(7); 1978; 90)

319 Butter buds introduced to the food industry

"Butter Buds", being sold by Beatrice Foods, is a concentrated natural butter flavor. The dry, free-flowing butter powder has a flavor intensity compared to a fresh butter of 16:1. Low fat content allows application in foods where the flavor of butter is to be distributed into a non-lipid phase. Possible applications include poultry injection, prepared cake, icing, and pudding mixes, snack dusting, and sauce or gravy mixes. (Food in Canada. 38(5); 1978; 51)

320 Beef flavor offers extra heat stability

A beef-type flavor developed for extra heat stability offers effective masking of off flavors. The product has a medium-roasted beef character which, when retorted, actually develops more impact. It is an experimental flavor classified as a natural, and offered in a dry powder form. In addition to the medium-roast character, "light" and "dark" roast versions are also available on request. The basic flavor can be teamed with other beefy flavors to form a specific flavor system for a given product.

Some of the applications tested by the supplier include use in extruded textured protein analogs, canned gravies, gravy mixes imitation meat dishes and canned soups. (Processed Prepared Food. 147(3); 1978; 52)

321 High protein flavor enhancers

Amber Laboratories announces the availability of a new line of flavor enhancers with a protein analysis of 50 percent. Amber-ex 1003, 5000 and 5500 are water soluble yeast extracts with textures that blend well with food ingredients used in meat products, soups, sauces, gravies, spices and seasonings. Packed in poly-lined fiber drums, these are available in both spray-dried and liquid concentrate forms. (Processed Prepared Food. 147(7); 1978; 90)

322 Improved onion, garlic flavors

Encapsulated onion and garlic oils offer advantages including fresh, natural flavor notes, good dispersion in foods and increased heat stability. Improved methods of encapsulation also offer good shelf stability, and natural final flavor.

Formulated for use as pound-for-pound replacements for conventional dry onion and garlic powders, the oils contain more drops of oil per gram of oil than was previously possible. This aids in rapid and complete dispersion of the oils. More of the previously lost volatile fractions are included in the improved products for

enhanced flavor. Cost per pound is said to be lower than that of onion or garlic powder.

Lipase-splitting enzymes are removed in the encapsulating process, and the flavors are considered industrially sterile. So products are applicable to fat-based foods and food products that are not heated in their processing. (Processed Prepared Food. 147(3); 1978; 52)

323 Amberex yeast extract

The Amber Laboratories of Juneau, Wisconsin, have introduced a spray dried autolyzed yeast extract that is soluble in water and has a pleasant bland flavour. This material, described as Amberex 1003, is claimed to bring out cheese flavour notes in bakery products, and cheese and meaty flavours in soups and sauces. This material is not only of high quality protein but that it has an unusually good amino acid profile. It is not only available in large quantities but can be obtained as paste or liquid. (Food Trade Review. 48(2); 1978; 85)

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* PROCESSES *
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324 Cassava drying

Cassava is a staple food crop in many South-East Asian countries and, in the form of starch, pellets, and chips, is an important export commodity. Processing generally involves chopping the roots by hand or by machine, then spreading the pieces to dry on a concrete floor.

As part of an IDRC supported project on cassava processing experiments were carried out in Thailand on different sun drying techniques. It was found that thin slices or strips dried more quickly than chips. The drying time was considerably reduced when the cassava was spread on a black topped floor. Drying trays sus-

pended above ground were also found to be effective because they permitted greater air circulation. (IDRC Reports. 7(3); 1978; 13)

325 Pretreatment of soyabean

Bitter taste and objectionable flavour are the two important constraints in the use of soyabean. Different roasting and cooking treatments were tried to overcome this drawback. It was found that roasting the seeds on a hot pan until the seeds are lightly browned or cooking the seeds after presoaking renders the product agreeable and palatable to consumers. Addition of sodium bicarbonate improves the consistency of the cooked product. Presoaking for 9 to 12 hours would be adequate for the variety No.2120 which has small seeds. (Farm Science. 5(7); 1978; 32)

326 Manufacture of milk shake

Milk shake, a product of Western origin is obtained by freezing a mix very similar to soft-serve icecream mix and speed-mixing the frozen product in a mixer to make it pourable and generate foam in it. It has lower fat and sugar contents and higher milk-solids-not-fat (msnf) content than icecream. The milk shakes that are commonly sold in this country usually consist of sweetened cold milk added with fruit pulp and flavouring. In view of the increasing popularity of these products, it is expected that a genuine milk shake would be preferred by the consumers. A study, therefore, was undertaken to standardize the method of manufacture of milk shake under Indian conditions. It was also extended to obtain the products in a powder form that could easily be reconstituted by the housewife.

The ingredients required i.e. whole milk, SMP, sugar and stabilizer (sodium alginate) were weighed and mixed as follows: Sugar (at the rate of 10%) and stabilizer (at the rate of 0.4%) were dry-mixed first. The milk was warmed upto 40°C and the SMP was slowly added to it with continuous stirring. The temperature of the mixture was then raised to about 70°C before adding the sugar-stabilizer mixture. After thorough mixing, the liquid was filtered through a muslin cloth and while at about 60°C it was homogenized

in two stages - first at 175 kg./cm.² and second at 35 kg./cm.² pressures. The homogenized mix was pasteurised at 71°C for 30 min. The mix was then cooled to about 10°C and aged for 2-3 hour at 6°-10°C. Following aging, the milk-shake mix was frozen in a soft-serve icecream freezer using strawberry flavour (at the rate of 0.1 ml./litre). The drawing temperature varied between -2° and 6°C. The frozen mix was blended in a mixie for 90-120 sec. to produce a milk shake.

The milk shake with fat and msnf levels of 4 and 13% respectively, was found to be most acceptable with respect to the whipping ability of the mix and foam stability and sensory evaluation. This formulation was subjected to spray drying in an Anhydro spray drier. The powdered product contained 3.3% moisture, 15.1% fat and 17.7% protein, the rest being carbohydrates and ash. (Indian Dairyman: 30(8); 1978; 585)

327 Preparation of calcium caseinate from casein curd

Various factors leading to satisfactory conversion of acid casein curd into calcium caseinate dispersion with a low level of sedimentable matter (1-2% by wt.) were investigated in the laboratory and in pilot-scale processing equipment. Results obtained showed that calcium caseinate could best be prepared by reacting finely-milled, well-hydrated soft casein curd with $\text{Ca}(\text{OH})_2$ at $\leq 40^\circ\text{C}$. The conversion process was adversely affected by the use of 'harsh' curd or dry casein and by higher reaction temp. Destabilization of calcium caseinate dispersions to form a gel often occurred on heating, particularly at high concn. and low pH. This sometimes precluded heating of the concentrate to pasteurization temp. prior to spray drying. The destabilization was reversible, however, as the dispersions re-liquified on cooling. (Protein Foods and Nutrition Development Association of India, Newsletter No.77; 1978; 2)

328 Potash containing peeling solution

Instead of caustic soda for fewer waste-water treatment pro-

blems, Peel-E-Z not only peels fruits and vegetables more efficiently than caustic soda, the wastes can be spread back on the growing fields without expensive disposal treatments. No new equipment is needed for conversion to Peel-E-Z and the solution is active at lower concentrations than caustic soda, therefore the use rate is lower. (Processed Prepared Food. 147(3); 1978; 100)

329 More tender beef

From now on, slaughterhouses can sell more tender meat and economize at the same time. Research at the Brandon Station (Canada) has shown that half-carasses of beef stored at 7-8°C for upto 72 h. were more tender and tasty than the corresponding halves stored at the normal temperature of 1°C. The results of chemical analysis were almost identical for the two halves. The refrigeration temperature that produces optimal culinary quality varies with the weight and degree of finishing of the carcasses. (Indus. Alim. Agric. 94(3); 1977; 309)

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*      UTILIZATION                   *
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330 Blood protein, a neglected food source

The protein blood from slaughtered animals can now be recovered in the form of white powder that is 95 percent pure protein. The powder is odourless and tasteless and blends easily with many foods. There are two major types of protein in blood, plasma protein and heme protein. Presently, only the plasma protein is economically viable.

The protein concentrate, which is merely isolated and spray-dried, has very desirable characteristics of solubility, whipping ability and emulsification. One major use for the blood plasma protein is as a food binder in ground meat products, where, as little

as one percent added to ground beef makes a hamburger patty hold together. (Processed Prepared Food 147(7); 1978; 72)

331 Garment from pineapple fibre

The Cottage and Small-Scale Industries Department of the West Bengal Government has developed the pineapple fibre for making furnishing material and garments.

The fibre is stronger than cotton or jute. The yarn developed is soft and can be used for making shirts and coats. The twisted yarn obtained from pineapple fibre can be used for manufacturing furnishing materials.

Experiments are being made to better the quality of fibre by chemical treatment. It is estimated that a minimum of 2 tonnes of pineapple fibre is needed to manufacture textiles on a commercial scale. (Industrial News Digest. 1(9); 1978; 11)

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* PROCESSED PRODUCTS *
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332 Algae-based health foods popular in Japan

In the last 10 years or so, algae-based health food is popular in Japan because of its high mineral and vitamin content and is marketed via over-the-counter drug channels.

Chlorella has a flavour some-what like fishy spinach. Its commercial hydroponic production began over a decade ago in Japan. Though it is fast growing and contains more than 20% high grade protein, however, chlorella is still too costly to fill the role of "hydroponic staple food" foreseen by its early developers. However, it is a good natural source of calcium; iron, phosphorus and a range of vitamins (in natural form).

Serious research is on to bring down the production costs of chlorella. One recent innovation is closed-system culturing, where

metal caps, pies wrapped in foil, foil pouches and packets and products in aluminium cans. (Processed Prepared Food. 147(7); 1978; 92).

335 Metal detector for food processors

The Metal Detector-Pipe Line Reject System detects ferrous and non-ferrous metal contaminants in meat emulsions, pickle relish, peanut butter and hundreds of other products.

Before the foods are packaged, the system inspects and detects metal particles as the food passes through a pipe line. It consists of a Stearns metal detector inspection head installed around a short, non-metallic pipe line section. This section replaces an existing section of stainless steel pipe. When metal is detected in the non-metallic pipe line food flow, a solenoid-actuated diverter valve opens. This action momentarily rejects contaminated material into a reject container. The amount of material rejected is controlled by timers which reset automatically to maintain normal product flow for inspection.

The metal detector inspection head and diverter valve are electronically controlled from a remotely mounted cabinet. The cabinet contains reliable, solid state printed circuit boards and also has a viewing window through which non-technical personnel can monitor inspection operations on a digital readout.

The system is also available with or without the diverter valve in which case an alarm bell can be activated to alert personnel of a metal detection in the pipe line. (Food in Canada. 38(4); 1978; 75)

336 Highly versatile electronic balance

Suitable for a wide range of products, this electronic balance features high weighing accuracy, hence precise filling without product give away. Typical applications include wrapped and loose candies, biscuits, wafers, snacks, nuts, potato chips, frozen foods, etc. Weighing capacity is up to 25 portions/min.

The products to be filled are conveyed smoothly via a powdered-chute system prior to being aligned individually for accurate taring. Electromagnetically operated gates prevent surplus items from entering weighing container. Depending on product, discharge can be by hopper or horizontal belt conveyor. (Food Engineering International. 3(5); 1978; 86)

337 Chapati rolling machine

The device, of two wooden rollers covered with smooth laminate to avoid sticking of the dough. The two wooden supports on either side of the rollers hold a wooden sloping guide-piece at the bottom. The roller at the rear end is fitted with a handle to enable the rollers to be rotated. The roller-supports are mounted on a wooden foot-stool, at the fore-end of which a knife with its sharp edge facing the stool is hinged.

A small quantity of edible-oil or fat is initially smeared on the rollers and the dough is placed over them with a slight pressure. The handle is gradually rotated in the anti-clockwise (forward) direction. The rolled dough then moves down the rollers on to the foot-stool, continuously, from which chapaties of required size may be cut out at regular intervals by means of the knife. The square chapaties thus produced may then be grilled over a hot griddle.

The size of the chapaties can be varied as desired by cutting at proper intervals. A slight modification of the device in mounting of the rollers by way of providing variable distance between them can produce chapaties with required thicknesses. This device could be of great use to housewives as well as hotels. (Invention Intelligence. 13(7); 1978; 278-9)

338 Espresso coffee plant

The Espresso coffee plant is made of standard brass and brightly chromed. The water container is made of aluminium alloy and has no leakage. There is water gauge to indicate the water

level. Model JMI-1 has one delivery channel and provides 200 to 225 cups of coffee per hour. Model JMI-2 also has one delivery channel. It supplies 100 to 125 cups of coffee per hour. (Industrial Products Finder. 6(12); 1978; 50)

339 Temperature probe for can makers

An electronic temperature probe designed for can-makers can be placed inside a curing oven to report and record ambient, container body or container contents temperatures curing process that require tight temperature control. The device records the precise temperature at equal time intervals during a heating process within pre-selected time frames. Information is stored in a memory bank then connected to a standard strip chart recorder after removal from the oven. When chain travel speeds are known, the plot of temperature and time can be translated to temperature and position in the oven. The probe is accurate to within one percent over a 500°F range. (Processed Prepared Food. 147(3); 1978; 104)

340 Water activity analysis easier

Measurements for water activity (a_w) of foodstuffs is simplified with a new instrument introduced by Watrous and Company, Inc. The unit includes two complete stainless steel measuring containers, two sensor heads with built-in temperature and humidity indicators, o-rings, barium chloride, special paper and thermally insulated strofoam case. Products including meat, poultry, fish and others can be rapidly analyzed. (Processed Prepared Food. 147(3); 1978; 104)

341 Cleaner delivers concentrated power

A rugged steam cleaner that produces a powerful discharge, called the Steamin Demon, concentrates the solution delivery to give the greatest possible impact on the cleaning target including cracks and devices.

Designed for use in food processing areas, there is no steam

in the heating coil, only a solid stream of high temperature water which literally blasts from the gun. The cleaner comes in a portable or stationary model and a remote control option is also available. (Processed Prepared Food. 147(7); 1978; 63)

342 Scrubber-washer ideal for small capacity

The Magnascrubber^(R) and Magnawasher^(R) are suitable for processors with smaller capacity peeling of root vegetables. The equipment is designed for use after caustic or steam pretreatment and combines dry peeling after finished washing in a single compact unit that conserves floor space.

In the scrubber section, stud rubber rolls gently remove softened peel without water, while the washer section rinses off any remaining peel waste saving upto 90 percent of the water ordinary washes require. All peel material is collected and removed separately, keeping it out of the regular plant effluent. (Processed Prepared Food. 147(7); 1978; 58)

343 Ultrasonics used to clean plastic containers

A British machine for cleaning plastic containers, such as bottle crates and cakery baskets utilizes ultrasonics and is capable of removing static soil as well as surface dirt. Ultra clean can also save users significant sums by low operating and maintenance costs the manufacturer claims.

The equipment, which is 21 ft. long by 4 ft. 6 in. wide and 4 ft. 6 in. high, can be incorporated into existing production lines. Practically every type of rigid plastic case can be cleaned by the machine. It readily accepts standard crates and trays, etc., and can be tailored to suit nonstandard shapes. Equipment has already been built to clean 1,500 containers an hour.

Besides being safe and simple to operate, the equipment is economical; power consumption is only 6kW, detergent usage minimal and the tanks are thermally insulated. (Food in Canada. 38(4); 1978; 75)

344 High-pressure cooler

National Engineering Company manufacture high-pressure coolers. A gas cooler has been manufactured by them and tested at 345 kg/cm^2 pressure. Also available are steam-to-air heaters, fuel oil heaters, coil type coolers and inter/after coolers. Pressure vessels, receiver and storage tanks, reaction and jacketed vessels, fabricated strainers and filters, lead/rubber-lined vessels and chemical equipment. The products are used in power stations, as well as chemical, petrochemical, pharmaceutical and process industries. (Industrial Products Finder. 6(12); 1978; 47)

345 Cold storage unit-solar based

A cold storage unit based on solar energy, with immense potentialities for widespread use in rural areas, is being developed by the Mechanical Engineering Department of the Indian Institute of Technology (IIT), Bombay.

It is a small, half-tonne refrigerator, that can preserve commodities stored in a $6\text{m} \times 4.5\text{m} \times 3.6\text{m}$ room. A project report will be submitted to the Government which is expected to help in taking a decision on whether the project can be commercially exploited for the benefit of the farmers. (Documentation Bulletin, Vaikunthbhai Mehta Smarak Trust, Bombay. No.32; 1978; 9)

346 Cost of cooking food by solar heat

Food can be cooked by direct solar heat when there is some concentration of the radiation on to a cooking pot or a simple type of oven. Cooking could also be done by solar heat indoors using flat-plate collectors if there were some sort of continuous heat transport from the collectors outside. Alternatively, massive heating plates could be heated up outside and brought inside to do the cooking. Cooking outside by solar heat is regarded as not practicable because it is not acceptable. From the data of Garg (1976) it can be estimated that an oven type of cooker could be put on sale in India at a price of about \$80. For the oven con-

sidered, this price would imply about 30 ¢/effective kWh(t). About the same kWh(t) price can be reckoned for the flat-plate collector with a heat-transport system. The cost of a system of pre-heated massive heating plates cannot yet be estimated because the necessary data regarding heat storage still requires some investigation. As such cooking by means of solar radiation is not economically feasible. (Documentation Notes. August 1978; 3)

347 Cost of cold storage by solar drying

A cold store of 75 m³ requires an absorption refrigerator of 3 kW cooling power, collectors of 100 m area and a cold store of 10 m³ of ice (reserve for 14 days). Such a system will cost in India:

100 m ² of flat-plate	
collectors: 100 x \$100	\$10,000
Refrigerator (3 kW)	\$ 2,400
Ice cold store	\$ 400

	\$12,800

The annual costs are then \$1500. To get the same cooling with a conventional refrigeration system, 2.5 kW(e) or 9 kW(t) is necessary. The annual costs of the necessary electricity in non-electrified regions would be \$1800 in India and \$2800 in Upper Volta. Oil costs would be \$1600. To make a comparison with a refrigeration installation powered by solar radiation, the costs of a conventional refrigeration system have to be added, viz. about \$300/year. It is evident that a solar-powered refrigeration system is competitive. Comparison with the possible yields shows that the investment can be economically feasible. (Documentation Notes. August 1978; 3)

348 Horizontal flour mill

Kohinoor horizontal flour mills are said to be fitted with ball and thrust bearings. The mill comprises an all-steel frame and quality mill stones. The stones are conveniently encased in a sheet

steel covering. A driving pulley is fitted, which can be raised or lowered by means of an adjusting screw for aligning. Feed regulator consists of a cast iron conical tube with raising and lowering lever screw and hand wheel. Hopper is made out of sheet steel. Four models are available with capacities ranging from 80 to 250 kg/hour, approximately. Also available are vertical grinding mills, hullers, masala powdering machines, and Marshall (Bombay) type grinding flour mills. (Industrial Products Finder. 6(12); 1978; 46)

349 Mini jar roller mill

The mini jar roller mills designed for the crowded laboratory, mixes and grinds costly chemicals, dyestuff, coal and powders in quantities ranging from 10 to 200 g. The portable mill occupies small space. It avoids wastage and production of heat in the material. There are two Neoprene rubber rollers -a driver and a trailer. They are 15 cm long and have 25 mm diameter, and carry jars or bottles from 25 to 100 mm diameter. It is reported that the jar roller mill mixes the material thoroughly and uniformly. (Industrial Products Finder. 6(12); 1978; 41)

350 Automatic oven for wafer cones

Smallest in a range of automatic sugar-wafer baking machines, this oven model Jupiter-19 is designed to produce waffle cones or cylinders at a rate of upto 1500/h. Output depends on wafer size, batter formulation and heating time.

The machine has 19 plates of 200 x 200mm fixed to an endless carrier chain. Plate bearings are self-lubricating to simplify maintenance. Rolling tools are fully interchangeable. Batter injection is automatic and can be varied steplessly by a highly accurate piston pump. The oven can be supplied for town gas, natural gas bottle gas heating. (Food Engineering International. 3(5); 1978; 32)

A new range of book moulds has been developed for the production of hollow and filled chocolate products such as eggs or surprise items. The book moulds, made of plastic material, are claimed to give trouble-free demoulding and hence improved product appearance. They can be adapted to suit practically all existing shell moulding plants. Engravings can be made to customers' specifications.

In addition to book moulds, a complete series of single plastic moulds in a large variety of types and sizes are also available for sale. (Food Engineering International. 3(5); 1978; 86)

352 Meat slicer

A new model of the Herlitzius meat slicer is designed to handle a greater range of meats than the original 80K model, both fresh and frozen (down to -7°C). The aperture has been enlarged to 24 x 17cm; this enables larger meat cuts to be accepted, particularly whole and long loins of pork. To facilitate handling a chain-in feed and belt take away conveyor have been added and the product gripper now has an automatic return. The latter reduce down-time and can be pre-set to a given length of product. For slicing meats preformed in casings or in a meat press, the gripper can be removed and the machine fed continuously. Slices ranging from 1-90 mm can be cut at a rate of upto 180/min. (Food Processing Industry. 47(557); 1978; 66)

353 Versatile machine mixes, disperses, homogenizes

There is no need for several separate machines with this equipment which carries out vacuum mixing, dispersing and homogenizing. Designed for the production of mayonnaise, salad dressings, sauces, ketchup and similar products, the equipment enables solids to be mixed into liquids, to be dispersed and homogenized, and finally deaerated. The finished, high quality product has no

air-pockets, thus simplifying filling with volumetric dosing systems. (Food Engineering International. 3(5); 1978; 78)

354 Mixer-Grinder

A company from Bombay has manufactured a mixer-grinder, a product specially suited to assist in the preparation of Indian recipes. The mixer-grinder is provided with a motor; there are others like noise reduction, easy cleaning of parts, provision of a stainless steel bowl for wet and dry grinding and other stainless steel parts to avoid rust. The mixer-grinder would cost Rs.820. (Seminar Reporter. 8(9); 1978; 30-1)

355 Pump/extruder handles viscous materials

The Vemag 3000-S2 pump/extruder handles the most viscous materials as well as products with chunk sizes upto three pounds. It accomplishes these production requirements with uniform flow rates between 1,000 and 40,000 pounds per hour. Portioning and forming attachments are also available. Some food items that are presently propelled on this equipment include poultry rolls, fish cakes, sausage, potato salad, processed cheeses, puddings and sectioned and formed hams. (Processed Prepared Food. 147(7); 1978; 58)

356 Versatile tenderizer

The most important feature of the new Belam MT30 meat tenderizer is that the cutting rollers are adjustable from zero to 15mm so that it will cope with virtually all meat cuts and muscles. Meat is carried on an infeed conveyor to the rollers and passes between them to fall into a trolley below. The conveyor attaches to existing butchery lines where required, while the rollers can be removed for cleaning and slotted back into position without the use of tools. The machine automatically switches off when the cover is not properly in position to ensure safe operation. (British Food Journal. 80(884); 1978; 94)

357 Mobile meat extruder

Fred Johnson (Machinery) Ltd., have designed a mobile sausage/pasty meat extruder the main feature of which is hygienic operation. It is claimed that dismantling and reassembly can be carried out in five minutes, during which time the machine can be cleaned completely.

The operating chamber is constructed of rustless materials and incorporates the three-grooved roller principle. The body is made in two halves and converted into a complete pressure chamber by a slide-in stainless steel hopper, a slide-in non-ferrous nozzle box and screw-on front plate. The hopper and front plate are electrically interlocked for safety. A pneumatic cut-off arrangement designed as a one-piece assembly can be attached quickly when the machine is required for depositing pasty meat. The extruder is intended for use over the F.M.J. sausage roll and pasty machine. (Food Processing Machinery. 47(557); 1978; 66)

358 Ultraviolet water purifier

Bajaj Electricals have introduced the Katadyn range of water purification systems, made in Switzerland. They use bactericidal properties of silver eliminating the chance of secondary infection. In Multus ultraviolet units, the UV burner (lamp) is placed in the irradiation tube in an axial position. The burner is protected by a quartz tube, UV rays within a certain spectrum kill micro-organisms. An even distribution of the UV light as well as the baffles that create turbulence of water guarantee an optimum kill rate. Other products available include Electro-Katadyn units, filters, powders and tablets. (Industrial Products Finder. 6(12); 1978; 11)

359 Belt vacuum filter

ADPEC, a horizontal belt vacuum filter is finding new markets for its application in Britain and South Africa.

Claimed as having cost advantages over other types of horizontal type belt filters, ADPEC is specifically designed for use in

the food (sugar and starch), and pharmaceutical industries for dewatering, extraction and washing processes, and in the vegetable and edible oil industries for winterizing, crystallization, solvent extraction, bleaching and filtering. (British Food Journal. 89(884); 1978; 94)

360 Corrosion of stainless steel

Refuting the popular assumption that stainless steel is immune to corrosion, the causes and cures for pitting, cracking and crevicing in process equipment, vessels and piping have been listed.

The corrodents commonly used in the food processing and other industries have been identified and precautions for cleaning, operating and shutdown procedures have been suggested. (Processed Prepared Food. 147(7); 1978; 65)

361 Noise control for food plants

Industrial Noise Control, Inc., offers a variety of materials for noise problems in food plants which includes barriers, absorbers, composites and dampers. (Processed Prepared Food. 147(3); 1978; 90)

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*   PACKAGING   *
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362 PVC paper

Honeymoon Plastics have developed Honeyplast PVC paper for bringing down packaging costs, reportedly replaces gelatine and cellophane paper. It is fully transparent, strong, water-proof and 40% cheaper. (Industrial Products Finder. 6(12); 1978; 49)

363 Vacuum packaging unit for low-volume needs

This machine brings vacuum packaging to the butcher, grocer, supermarket, retail outlet, hotel, restaurant and caterer at relatively low costs. Made of stainless steel throughout, the packaging machine allows storing of perishable foods such as meat, fish, pre-cooked meals, delicatessen and similar products for upto 3 weeks, when refrigerated, thus meeting demand peaks.

Two models are available with usable chamber sizes of 440 x 460 x 180 and 440 x 560 x 180mm, respectively. Both have an electronic control housed in a cassette for ease of maintenance, and a built-in vacuum pump. (Food Engineering International. 3(5); 1978; 88)

364 Automatic and semi-automatic fillers

The National Instrument Company, USA, offer their 650cc, 1,300cc and 4,500cc capacity filling units for use with automatic or semi-automatic Filamatic volumetric fillers. These filling units are interchangeable with the smaller capacity 520cc and 1,000cc filling units on Filamatic Models DAB-16, DAB-16-2, DAB-32, DAB-32-2 and DAB-4. The larger capacity filling units are available in Types FUS, FKS, FQS and FSV, for handling water-thin or viscous liquids, adhesive type materials and products containing a high percentage of particulate material. All product containing parts are fabricated of Type 316 stainless steel. The fillers are available in no-thread types for sanitary applications. (Industrial Products Finder. 6(12); 1978; 13)

365 Can filler/closer is easy to reset

Versatility is the key feature of this automatic can-filling and closing machine model 100-Combi. Suitable for handling tin-plate, aluminium, carton and plastic containers as well as a variety of closure types, the machine can be reset from one type or size to another within a few minutes, thus rapidly meeting varying production requirements. Output is upto 80 cans/min for the standard

unit, and upto 140 cans/min for the duplex machine. (Food Engineering International. 3(5); 1978; 78)

366 Simple feeder system aligns candy, chocolates

The feeder for packaging machines gently aligns small confectionery products such as candies, chocolates, pralines and coated biscuits in a simple yet reliable manner. The system consists of two conveyors placed at an angle of 45° to each other, one working intermittently, the other continuously. The step-by-step movement of the intermittent conveyor causes items to be deposited on an intermediate conveyor. Here, they are gently aligned by a vertical belt which pushes them to the conveyor wall without damage. (Food Engineering International. 3(5); 1978; 33)

367 System wraps 300 chocolate bars/min

Comprising an automatic infeed, a wrapping machine, and a carotoning machine the packaging line is designed for wrapping chocolate bars of 50 to 100 g at a rate of 300/min.

Heart of the line is the wrapper Swisspac-3. This machine wraps chocolate bars in aluminium foil from reel stock and applies portfolio or band-label wrapping from stack or reel. Wrapping is folded underneath the product and glued longitudinally by a hot-melt system. Wrapping speed is adjustable during operation. (Food Engineering International. 3(5); 1978; 32)

368 Lined cartoner for granular products

Designed to handle most granular and free-flowing products, this machine can operate 100-g packets of tea at a speed of upto 150 cartons/min. Carton liner is fed from the reel, cut to size and formed around the first of 16 vertical mandrels. After the longitudinal seam has been sealed, the bottom fold is made. A carton blank is fed from the magazine and formed around the liner on the mandrel. The lined carton is then passed to the rotary filling section.

The machine can also be built to produce single-wall heat-sealed bags or double-wall bags. (Food Engineering International. 3(5); 1978; 33)

369 Seals plastic food bags of upto 380-mm width

Specifically designed for sealing polyethylene, polyamide, PVC and similar plastic bags as used in the food industry, this table-top unit is particularly suitable for packaging frozen foods and pre-cooked menus.

Sealing can be initiated either by a foot switch or by automatic control, thus ensuring continuous operation. Based on the heat-pulse system, all units in the TM series incorporate two sealing rails, each driven by a separate pulse generator. Duration of the sealing pulse and contact time can be pre-set. Units are available for widths of 280- and 380-mm. (Food Engineering International. 3(5); 1978; 82)

370 High speed powder packer

A wide range of powders, granules or piece-type products can be packed into cans, drums, bottles or cartons at speeds of upto 14,400/h with this versatile machine.

Designated Auto-Transfer-Mk-II, the container-handling system can be supplied with various types of fillers and feed weighers to suit specific applications. Designed for hygienic and reliable operation in dusty conditions, the line can handle open-top rigid or semi-rigid containers with cross sections of 57- to 178-mm. Single or twin-track models with single or multiple indexing are available for outputs between 7,200 and 14,400 containers/h. (Food Engineering International. 3(5); 1978; 96)

371 Pillow - Pack wrapping machine, Type 260 HF

This new machine was designed to produce pillow-type tumble packs of sweet or savoury biscuits, sliced bread, nougat and chocolate-coated bars and similar flour or sugar confectionery items.

The pillow-type pack is made by forming a tube round the product, the longitudinal seal being made by the application of heat to an overlap, and the two ends of the pack are crimp sealed. The wrapping material, fed from the reel, can be of regenerated cellulose, coated paper, polypropylene film, aluminium foil or laminate. The items to be packed are placed between the carriers of a chain-type conveyor feeder and are automatically spaced and guided into the wrapping station. The roller that draws the wrapping from the reel is driven in synchronism with the sealing rollers. After the flexible packaging is formed around a filling tube, the items to be packed are filled; the top and bottom seals are crimped and at the final operation each pack is separated by a cut-off across the seal. The finished packs leave the machine on a delivery conveyor. Output rates of upto 400 pillow packs a minute can be achieved and the size range of product is from 50 x 20 x 2mm to 315 x 140 x 70mm. A photocell unit ensures accurate register of graphics when employing pre-printed wrappings. (Perfectpac. 18(7); 1978; 25)

372 Pillow - Pack wrapping machine for panned pieces of chewing gum,
Type 150 CHS

This machine features a vibratory hopper from which are discharged the pieces of panned chewing gum on to a multi-track feeder. The standard version of the feeder has 13 tracks, permitting the production of 2 to 6-piece packs. By means of a rotary transfer system the panned gums are transferred from each track to a continuous conveyor with cup-like receptacles, for onward transmission by a chain transfer to the wrapping station. A photocell control checks whether the feed tracks are properly filled. If they are not, an alarm is given or the machine is automatically stopped. A sorter automatically ejects faulty or sub-standard pieces of gum. The wrapping material, paid out from the reel, is first formed and the longitudinal seal is fin sealed with rollers. Then two transverse sealing rollers close both ends of the pack, which is finally cut off. The finished packs are discharged from the machine by an inclined chute. Strip packs containing a single row of two, three, four, five or six panned pieces can be produced. For two-piece

packs the machine is fed by eight tracks, i.e. four sets of two tracks, in which case the output rate is 480 packs or 960 panned gums per minute. When making six-piece packs the panned gums are fed on two groups of six tracks giving a production rate of 240 packs or 1440 pieces of gum per minute. Sizes of the panned pieces handled are from 16 x 6 x 5mm to 26 x 14 x 8mm. Wrapping materials can be cellulose acetate or polypropylene film, waxed glassine or foil-wax paper laminates. Laminates have a polyethylene coating as a barrier against water vapour and to prevent loss of aroma. Saran films can also be used. An alternative version of the permit gums to be packed in two rows of either three, four, five or six pieces. (Perfectpac. 18(7); 1978; 25-6)

373 Automatic coffee vendor

Automats (India) have developed a fully automatic coffee vending machine. On insertion of a one-rupee coin (other coin combinations are possible) the dispensing cycle is set in motion. A plastic, throw-away cup is first dispensed on to the serving platform. A measured quantity of pre-mixed powder (comprising proportionate quantities of soluble coffee powder, milk and sugar powders) drops into the cup. A nozzle then dips into the cup and delivers a measured quantity of hot water in a manner that completely dissolves the powder-mix resulting in hot, delicious coffee. The machine has a capacity of 200 cups each of 120 ml per charge. It indicates, by means of lighted panels on the front face, when the cups have finished, or water is finished, or water pressure is low. In case the cup is not dispensed, the powder-mix and hot water are not delivered and a one-rupee coin is returned. Only a genuine coin would trigger off the dispensing cycle; under-denomination or counterfeit coins would be returned. The vendor can be fully loaded within 15-20 minutes. It consumes about 1.5 units of electricity per hour. (Protein Foods and Nutrition Development Association of India, Newsletter No.61; 1978; 2)

374 Paper-bonded packing label

Paper-bonded packing labels are made out of tin sheets of 26/28 gauge thickness. Printed paper can be bonded on the sheet, showing the address, quantity, size, weight, length, or grade. Blank column on the label can be filled in by the user only at the time of despatch. Labels can be nailed or inserted at the time of fixing strips. This system reportedly ensures that the label will reach the customer alongwith the package. Usual size is 6.35 x 10.16 and 10.16 x 12.7cm. (Industrial Products Finder. 6(12); 1978; 49)

375 Bottle cap is easy to open

Saturn is the name of a new capping system for glass bottles that comprises an easy-to-open closure and the corresponding capping machine. An economic alternative to the conventional crown cap, the new closure can be pulled off easily without an opener or any auxiliary device. Made of aluminium alloy, the cap has a highly elastic seal that withstands internal pressures upto 10 bar. It can be used for carbonated or pasteurized drinks as well as for beverages filled under vacuum. Although special cappers are available, slightly modified conventional capping machines can also be used to fit the new closure. (Food Engineering International. 3(5); 1978; 96)

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376 Science and technology in the current Plan

In the current Plan, the outlay proposed on science and technology programme in both plan and non-plan schemes is higher by over Rs.14,000 million (Rs.24,910 million) compared to the central sector expenditure of Rs.10,698.5 million on S & T during 1974-78.

Some of the basic facts on science and technology are as under:

- a) Expenditure on science and technology each year amounts to Rs.4000 million. This represents 0.6 percent of GNP.
- b) India today has the third largest complement of qualified manpower, next to USSR and USA.
- c) India's scientific and technological manpower is rising by 9 percent each year. During the two decades it has grown to a pool of 2 million.
- d) There are nearly 900 institutions, including universities.
- e) The Council of Scientific and Industrial Research (CSIR) in its various national laboratories has developed 1000 processes.
- f) Fourhundred of these CSIR processes have gone into commercial production. The output generated is worth Rs.4000 million a year.

(Economic and Commercial News. 7(44); 1978; 13)

377 Incentives for rural units in Haryana

Chief Minister, Devi Lal, announced a bonanza for those starting industries in the rural areas. The Chief Minister listed a set of 14 incentives while inaugurating the Haryana industrialists' convention. Entrepreneurs will be exempted from stamp duty and registration charges while finalising equitable mortgages. They will get interest subsidy over and above 6% on loans secured from financial institutions. 10% seed money with 4% annual interest will be given to tiny units. Subsidy will be given for buying improved tools and machinery. The incentives will be given for five years to start industries in the Faridabad-Ballabhgarh belt and for seven years in the backward and rural areas, 10 km from municipal limits, and tiny units areas.

(Data India. 44; 1978; 700)

378 Small units to get easier loans

Commercial banks have been directed to insist on collateral security by way of immovable property or third party guarantees while granting loans to small-scale industrial units. The directive,

issued by the Reserve Bank of India (RBI), follows the Centre's acceptance of the Puri Committee's recommendations on bank credit problems faced by small units. The recommendations of the Committee headed by Development Commissioner for Small-Scale Industries, I.C. Puri, had earlier been rejected by the RBI. Commercial banks have been asked to be guided, instead by the viability of projects while entertaining credit or loan application. (Data India. 32; 1978; 499)

379 Lack of facilities hits banana deal

Lack of canning facilities has denied India a lucrative export market for bananas which are much in demand abroad for baby foods and varieties of ice creams. This is despite the fact that bananas were in plenty for the greater part of the year. Exports in form of processed jam were negligible. The SISU study says that the annual production of fruit in the country, alongwith vegetables, is about 30 million tonnes, of which nearly 20% goes waste owing to lack of transport, storage and processing facilities. The export of processed fruit and vegetables in 1976 amounted to 23,450 tonnes (Rs.128.8 million) against 14,638 tonnes (Rs.77 million) in 1975. Mango juice topped with 29.24% (in value), followed by pickles 12.5%, and mango nectar 7.51%. The four Southern States contributed 6,131 tonnes of the output. (Data India. 34; 1978; 536)

380 Production and capacity for different bakery products for 1973-74

(in '000 tonnes)

Bakery items	Capacity	Production	Unutilized capacity
Bread	427.3	319.6	107.7
Biscuits	252.9	155.5	97.4
Other bakery products	97.2	72.9	24.3
Total	777.4	548.0	229.4

(Indian Miller. 8(5); 1978; 9)

381 Production of bread by sectors

(in '000 tonnes)

Sector	1978-79	1983-84
I - DGTD	171.8	360.8
(a) Public	104.0	238.1
(b) Private	67.8	122.7
II - Small Scale	402.2	668.9
(a) Factory	188.7	325.2
(b) Non-factory	213.5	343.7
III - Total	574.0	1029.7

(Indian Miller. 8(5); 1978; 9)

382 Production of biscuits by sectors

(in '000 tonnes)

Sector	1978-79	1983-84
I - DGTD	117.9	198.6
II - Small Scale Sector	122.4	172.8
(a) Factory	61.8	92.9
(b) Non-factory	60.6	79.9
III - Total	240.3	371.4

(Indian Miller. 8(5); 1978; 11)

383 Flour requirements for bakery industry at full capacity utilization

(in '000 tonnes)

Bakery Items	1978-79	1983-84
Bread	505.9	907.5
Biscuits	234.4	362.3
Other bakery items	91.1	121.9
Total	831.4	1391.7

(Indian Miller. 8(5); 1978; 11)

384 Demand and supply of meat in India

Year	Demand (all meat) ('000 tonnes)	Supply poultry meat including broilers (tonnes)	Broilers (number in millions)
1971	690	89,000	4
1980 Low	910	-	-
1980 High	1,060	-	-
1985 Low	1,050	150,000	17.2
1985 High	1,400	-	-
2000 Low	1,570	300,000	71.8
2000 High	2,110	-	-

(The Economic Scene. 3(4); 1978; S 15)

385 Cardamom production

The final estimate of production of Cardamom for last season (1977-78) is placed at 3900 M.T. with state-wise breakup as:

Kerala	2900 M.T.
Tamil Nadu	300 M.T.
Karnataka	700 M.T.
T O T A L:	3900 M.T.

(Cardamom. 10(5); 1978; 35)

386 Area under Coffee - 1976-77 Season

State	(in hectares)		
	Arabica	Robusta	Total
Karnataka	68,369	32,557	100,926
Tamil Nadu	26,705	5,520	32,225
Kerala	2,926	49,718	52,644
Non-traditional areas	2,571	81	2,652
T O T A L:	100,571	87,876	188,447

(Indian Coffee. 42(10); 1978; 290)

387 Production of Coffee

Season	(in tonnes)		
	Arabica	Robusta	Total
1976-77	65000	37300	102300
1977-78	58750	63500	122250
1978-79	60000	50000	110000

(Indian Coffee. 42(10); 1978; 291)

388 Domestic consumption of Coffee in India

Calendar Year	Consumption (in tonnes)
1975	36,880
1976	37,702
1977	44,088

(Indian Coffee. 42(10); 1978; 291)

389 Output of processed foods (Organised Sector) in 1976

(in tonnes)

Group/Item	No. of Units	Installed Capacity	Output (estd.)
Meat Products	7	10,100	5,100
Egg Powder	1	300	30
Baby Foods	10	29,578	26,000
Milk Powder	18	37,389	18,500
Condensed Milk	6	13,300	5,000
Malted Milkfood	9	20,418	15,000
Butter	10	12,500	6,000
Ghee	19	16,500	9,500
Modified Milkfood	1	1,750	1,050
Ice Cream ('000 lit)	7	9,490	4,200
Instant Tea	2	850	600
Instant Coffee	2	2,139	2,100
Flour Milling	158	49,93,284	16,65,950
Casein	3	850	120

(The Economic Scene. 3(4); 1978; S 17)

390 Groundnut extraction net Rs.1,254 million

Groundnut extractions contributed foreign exchange of Rs.1,254.2 million during 1977. The Groundnut Extractions Export Development Association has, therefore, suggested that the import allocation of edible oils valued at nearly Rs.10,000 million, could be paid out of the foreign exchange generated by exports of oilcakes and extractions, and castor oils. (Data India 39; 1978; 611)

Item	Pilot project area		Non-pilot project area	
	Units	Cost(Rs)	Units	Cost(Rs)
Operational Cost				
Human labour (days)	103.2	329.09	99.61	286.76
Bullock labour pair (days)	23.34	265.77	22.58	261.95
Seeds (Kg.)	99.36	311.50	85.70	233.02
Manures (CL)	5.04	92.75	3.53	57.22
Fertilizers (Kg)	179.16	809.16	86.82	303.11
Irrigation	-	92.86	-	103.08
Crop protection	-	97.23	-	28.08
Miscellaneous	-	75.41	-	61.05
Interest on working capital	-	65.92	-	42.59
Sub Total	-	2139.86	-	1562.60
Fixed Costs				
Rent value 1/6th of gross produce	-	648.32	-	386.45
Land revenue and cess	-	11.92	-	10.42
Depreciation	-	109.57	-	129.45
Interest on fixed capital	-	76.85	-	70.13
Sub Total	-	846.66	-	596.45
Grand Total	-	2986.52	-	1972.29
Yield in quintals per hectare	30.27		15.50	
Gross Income (Rs)	3889.92		2163.68	
Cost of production per hectare (Rs)	2986.52		1972.29	
Net profit (Rs)	903.40		191.39	
Output-input relationship	1.30:1		1.10:1	
Per quintal cost of production (Rs)	97.01		118.31	

392 25,000 tonnes of potatoes to be exported

This year 25,000 tonnes of potatoes will be exported following good crops in Punjab, Haryana and Uttar Pradesh. The 'Chandramukhi' and 'Military Special' types will comprise the main export varieties since they have been accepted in foreign markets. The position will be reviewed after the arrival of the new crop, when exports could hopefully be increased. NAFED will be the exporting agency. (Data India. 43; 1978; 677)

393 Onion exports by NAFED to touch 75,000 tonnes

The National Agricultural Cooperative Marketing Federation (NAFED) will export about 75,000 tonnes of onion from the coming crop. Onions will be procured from farmers who will be paid between Rs.45 and Rs.60 a quintal. This decision will be reviewed later in the context of production, and exports continued if there is no fall. Farmers who produce not only enough for home consumption but also surplus for exports will be protected; they will not be allowed to suffer for excess production. (Data India. 43; 1978; 677)

394 Export of Coffee from India

Fiscal Year	Quantity in tonnes	Value Realised Rs. F.O.B.
1976-77	50,558	125,75,18,476
*1977-78	55,827	230,45,89,403
**1978-79	36,429	88,95,00,683

Source: 1964-65 to 1976-77 (DGCIS, Calcutta)

*April 1977-March 1978 Certificate of Origin (Prov.)

**April 1978-Sept. 1978 Certificate of Origin (Prov.)

(Indian Coffee. 42(10); 1978; 291)

395 Export of processed foods during 1977-78

Commodity	Quantity (tonnes)	Value (million Rs)
Guar gum	46,953.5	155.71
Fresh onions	55,779.7	87.00
Fresh meat	6,227.0	78.54
Frozen meat	9,412.0	71.41
Instant coffee	499.5	65.89
Mango juice	5,706.0	28.36
Walnut kernels	2,672.9	47.42
Instant tea	692.2	31.08
Pickles and chutney	4,726.7	29.80
Walnut-in-shell	3,509.4	25.88
Biscuits	3,221.9	23.60
Starch and its derivatives	17,624.6	19.73
Dehydrated vegetables	1,104.0	18.66
Guar meal	14,562.0	17.53
Canned vegetables	1,994.0	11.17
Cocoa products	605.5	10.52

(Economic and Commercial News. 8(34); 1978; 4-5)

396 Cattlefeed export permitted in 1978

The Centre has released 250,000 tonnes of de-oiled groundnut cakes for export during the current year. Exports will be canalised through the Groundnut Extractions Export Development Association. The policy change apparently comes because of falling exports overall and the adverse trade balance. However, the Association is to make available atleast 20,000 tonnes a month (at the fixed price of Rs.1,000 a tonne) for domestic needs. With earlier releases, before the export ban, releases now total 800,000 tonnes. (Data India. 42; 1978; 662)

397 Marine products exports from India in 1977

Items	Quantity (in tonnes)	Value (in '000 Rs)
Frozen shrimp	47,239	15,62,206
Frozen lobster tails	596	38,804
Frozen frog legs	2,834	65,967
Frozen fish	3,765	38,566
Frozen cuttle fish	1,088	17,314
Canned shrimp	128	5,221
Dried shrimp	235	1,711
Dried fish	4,220	22,730
Shark fins and fish maws	287	22,469
Frozen crab meat	23	651
Canned crab meat	50	3,144
Canned tuna	22	349
Beche-de-mer	67	1,947
Fish oil	45	122
Fish meal	3,594	8,027
Miscellaneous	771	8,146
T O T A L:	64,964	17,97,374

Source: Statistics of Marine Products Exports-1977. The Marine Products Export Development Authority, India.

(Marine Fisheries Information Service. No.1; 1978; 14)

398 Iodised salt exports to Nepal

India will export 75,000 tonnes of iodised salt to Nepal during 1978-79 against 70,000 tonnes in the previous year under an agreement signed June 26. The cost of iodisation and transportation to inaccessible regions of Nepal will be borne by India. (Data India. 26; 1978; 407)

399 National board suggested to promote meat exports

The setting up of a National Meat Board, on the lines of other commodity boards, has been recommended by the Indian Institute of Foreign Trade (IIFT) to develop the meat industry on economic lines and to expand exports. IIFT made a survey of selected West Asian buyers - Kuwait, Saudi Arabia, Egypt, Jordan, Dubai, Abu Dhabi, Qatar, Oman and Bahrain to assess the export potential of meat and meat products. The survey shows that India's export of 11,410 tonnes of meat worth Rs.105.6 million in 1976-77 formed only a fraction of the country's large export potential. India has one of the largest livestock populations in the world. The survey highlights the constraints the meat industry faces and suggests sweeping changes in production, processing, transport and marketing. The creation of Centrally-sponsored disease-free zones is recommended, as many West Asian countries are insisting that the meat should come from disease-free areas. The survey points out that primitive and unhygienic conditions in the slaughter houses are coming in the way of production of wholesome meat. Export licences should be given only to those slaughter houses which maintain hygienic standards. IIFT has also suggested the setting up of State level meat corporations and liberalisation of livestock exports. (Data India. 35; 1978; 550-1)

400 US duty cut on Indian items

The US has reduced the rate of customs duty on a range of items of particular export interest to India. The tariffs on certain types of jute, mice, mango, coir products, frog meat, opium and some categories of carpets were lowered and in some cases even eliminated in a proclamation issued by President Carter September 21. The action came in implementation of the Indo-US understanding on tropical products reached in an exchange of letters in Geneva July 26. (Data India. 39; 1978; 611)

401 17.5% excise duty on sugar

The Centre, August 16 announced new excise duty rates on sugar following decontrol, the new basic and addition excise duties being 11.5% and 6% ad valorem, respectively. Upto now the duty on levy Sugar had been 11% and on free-Sale sugar ad valorem. There will also now be an exemption rate of Rs.25 per quintal till September 30 for excess output. (Data India. 33; 1978; 520)

402 Tea export quota and export duty cut

The Commerce Ministry has slashed the export duty on tea from Rs.5 per kg to Rs.2. Simultaneously, the quota of total exports has been cut from 225 million kg (last year) to 200 million kg. Further, producers have been asked to ensure that atleast 80% of tea is offered for auctions in the domestic market for easier local availability. The export duty relief may, however, be temporary as the situation will be reviewed in December. The excise tax on loose tea varies between 40 and 130 paise per kg; in addition, there are States sales taxes averaging 6% and a Central sales tax of 4% for registered dealers and 10% for others. There is, further, a development cess of six paise per kg. Income-tax is levied in 60% of tea estate profits. State agricultural income-tax is levied on the remaining profits, the rates ranging from 50 to 60%. (Data India. 36; 1978; 566)

403 India, 7 countries to form tea union

India and seven other countries have signed an agreement to form an international tea promotion association. Sri Lanka, Mauritius, Malawi, Kenya, Tanzania, Uganda, Indonesia and India will bring the union into force from February 23, 1979. (Data India. 41; 1978; 646)

404 Indian trade centre in Brussels

It was generally agreed that India would open a trade promotion centre in Brussels, which would be balanced by a new European technology centre in New Delhi, while the Indian government is yet to approve the former, plans are still not complete for the latter. EEC officials feel the Brussels centre could be a model for other centres in the city. Such centres are a future possibility for the five-nation Association of South-East Asian Nations and the 23-member Latin American Economic System. The Indian centre is expected to be opened early next year on the outskirts of Brussels, the city's world trade arena. It will be involved in exchanging delegations, organising trade fairs, market surveys and hiring of technical consultants. The centre will be financed partly by India and partly by EEC for the first three years, after which India will be wholly responsible for expenses and upkeep. EEC's expenses over the three years is estimated at \$685,000 on the basis of the understanding that EEC's contribution does not exceed 75% in the first year, 60% in the second and 50% in the third. The centre will be staffed by five Indian representatives, paid by India, and three European advisers, paid by EEC. About \$800,000 is spent each year by EEC countries in promoting trade with India. (Data India. 43; 1978; 676-7)

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** FOOD LEGISLATION AND  
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405 Groundnut oil refining ban lifted

With the massive imports of edible oils, the ban which had been imposed on the refining of groundnut oil to conserve local supplies has been lifted. The ban had, however, already become ineffective in the South where refineries had obtained a court order staying it; the ban was effective only in Maharashtra and Gujarat. The lifting of the ban has been welcomed by those units in particular

which had been rendered virtually idle not only by the ban but also by massive imports. About 50,000 tonnes of groundnut oil are now expected to be refined in 1978-79 from an estimated groundnut production of 1.4 million tonnes. The sudden entry of refined oil into the market had an impact on bullish prices. The country has at present, 62 refining units with an investment of Rs.2000 million; the installed capacity being 2000 tonnes a day. (Data India. 47; 1978; 746)

406 FDA sets shrimp standard

A final rule on standards of identity and the fill of containers for canned shrimp, effective July 1, 1979, was recently issued. The new standards bring U.S. packs into compliance with the internationally developed Codex standards for canned shrimp. The standards include provisions covering the size grading of shrimp, the type of shrimp used in canned shrimp and labeling requirements. The standards also cover shrimp cocktail and prawns. (Processed Prepared Food. 147(7); 1978; 72)

407 Urea receives GRAS status

As urea constitutes a normal body constituent and is constantly being produced during amino acid and protein metabolism and is a natural constituent in commonly consumed foods, the Select Committee on GRAS substances has granted GRAS status to urea. When used at current levels or at levels reasonably to be expected in the future, the committee concluded that urea was a safe substance. (Processed Prepared Food. 147(7); 1978; 72)

408 New grading system for wheat

The Canadian grain industry has agreed to a trial system of grading wheat according to its protein content, beginning August 1. The new system will provide Canada's 150,000 grain producers with new grades for Red Spring wheat for which the Canadian Wheat Board will pay a premium over other grades with lower protein content.

This will put more money in the hands of farmers, but also will require considerable capital investment in equipment on the part of grain-handling companies. (Food in Canada. 38(4); 1978; 7)

409 Detection of Taramira oil in Mustard/Rapeseed oil

Taramira (Eruca sativa Mill) grows abundantly in India and the oil is rich in erucic acid (37-46%). The pungency of the oil which resembles mustard/rapeseed oil is due to the volatile sulphur compounds. Hence it is often adulterated with mustard/rapeseed oil.

A thin layer chromatographic method for detection of this oil is developed. It is based on the appearance of greenish brown spots in the chromatogram (Rf 0.1 and 0.9) due to volatile sulphur compounds other than allyl isothiocyanate. The method can detect the presence of tarmira oil at levels of as low as 2%. (Research and Industry. 23(1); 1978; 31)

410 Restrictions on saccharine

As a sequel to Canada and USA imposing restriction on use of saccharine, the Joint twenty-first Session of FAO/WHO Expert Committee which met in April 1977, examined the several aspects arising out of three carcinogenicity studies with rats exposed in vitro and throughout life, a significant incidence of bladder tumours that occurred with dietary levels of 5% or more of saccharine. Consequent to this, the committee revised the previous unconditional ADI of 0.5 mg/kg body wt. (BW) to a temporary ADI for a man of 0-2.5 mg/kg BW and abolished the conditional ADI of 0.15 mg/kg for dietetic purposes only. (Food and Nutrition (FAO). 3(2); 1977; 23)

411 U.K. food standards and erucic acid

United Kingdom has laid down the limits upto which erucic acid may be permitted in edible oils, fats and foods prepared from rapeseed oil. For foods manufactured between 1 July 1977 and 30 June 1979, the limit is 10%; and of such foods manufactured thereafter is 5%. Foods containing 5% or less oil or fat are exempted, unless they are desc-

ribed as foods specially prepared for infants and young children.
(Food and Nutrition (FAO). 3(2); 1977; 23)

412 Color grader for apples, tomatoes

Irregularly shaped products including apples, tomatoes and apricots can be graded for color easily with a quality control instrument Agtron E 5-W. The unit reads an average color for the surface of the product being graded, which relates to the degree of ripeness of the fruit or vegetable.

Colour evaluation times are cut because product does not have to be peeled or chopped to get an accurate reading. Each selected unit is placed between a spring-loaded spindle assembly and rotated while the instrument reads the color. The California Department of Agriculture has been able to establish numerical limits for using the instrument. Agtron E 5-W would easily distinguish between existing grades for fresh tomatoes. (Processed Prepared Food. 147(3); 1978; 104)

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413 Oil complexes

The Andhra Pradesh State Government proposes to set up a castor complex in Telangana, a coconut complex in Coastal Andhra and a groundnut complex in the Rayalaseema region with assistance from the National Co-operative Development Corporation with a total investment of around Rs.15 Crores. (Industrial Development News. 13(7); 1978; 90)

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 * PERSONALIA *
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414 Secretary, DST

Prof. M.G.K. Menon, Chairman of the Electronics Commission, has been appointed Secretary in the Department of Science and Technology in place of A. Ramachandran, who has assumed charge as Executive Director of the UN Centre on Habitat at Nairobi. (Data India. 41; 1978; 656)

415 President, INSA

Dr. V. Ramalingaswami, Director, All India Institute of Medical Sciences was elected as President of the Indian National Science Academy, New Delhi for the term 1979-80, at the 44th Annual General Meeting of the Academy, held on 7th October 1978. (Sciencetech Bulletin. 5(10); 1978; 76)

416 World Food Programme Chief

Mr. Garson Nathaniel Vogel, formerly Chief Commissioner of the Canadian Wheat Board was appointed Executive Director of the World Food Programme from 1st October, for a period of five years. (Food and Nutrition (FAO). 3(2); 1977; 23)

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